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memorandum

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DATE: September 20, 1996

REPLY TO
ATTN OF: EM-43 (S. Warren, 301-903-7673)

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SUBJECT: Policy on Recycling Radioactively Contaminated Carbon Steel

To: Distribution

I am fully supportive of all efforts to minimize the disposal of metals as waste. We have a tremendous opportunity to accomplish this by the use of disposal containers fabricated from contaminated steel, especially since we not only have a significant demand for disposal containers, but we are the major generator of radioactively contaminated steel.

Effective immediately, it is the policy of the Office of Environmental Management (EM) that, to the degree that it is economically advantageous and protective of worker and public health, radioactively contaminated carbon steel (RCCS) either in storage or to be generated should be recycled. This EM policy will be in place for three years from the date of this memorandum, at which time it will be reevaluated. This policy is fully supportive of the various site-specific recycling initiatives underway or planned. More details on implementation of this policy are in the attachments.

Specifically, the policy for radioactively contaminated materials, including RCCS, generated by the EM Program, shall be: survey, decontaminate as necessary and appropriate (in compliance with DOE Orders), and release for unrestricted use any material that meets the applicable criteria. If decontamination for release for unrestricted use is not economically feasible, then the RCCS that is recycled shall be fabricated into one-time-use containers for disposal of low-level wastes generated by the EM Program, consistent with the attached radiological guidance.

I am looking for a site to aggressively lead the implementation of this policy. The lead site will be responsible for working with all EM sites to manage RCCS from generation to disposition as low-level waste disposal containers, including brokering small-site RCCS and achieving complex-wide economies of scale. I have attached the criteria I will utilize to evaluate your proposals. If your staff have any questions regarding this policy or the attachments, or if you wish to submit an application for the lead site by 14 October 1996, contact Stephen Warren (EM-43, (301) 903-7673).



Alvin L. Alm
Assistant Secretary for
Environmental Management

Attachments

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ATTACHMENT 1

**RADIOACTIVELY CONTAMINATED CARBON STEEL GUIDANCE
FOR IMPLEMENTING THE
OFFICE OF ENVIRONMENTAL MANAGEMENT'S
RECYCLING POLICY**

This attachment provides radiological guidance for implementation of the Office of Environmental Management's Recycling Policy for Radioactively Contaminated Carbon Steel (RCCS). Implementation is to be conducted at the site level. Each site is responsible for conducting recycling activities in a manner consistent with "as low as reasonably achievable" considerations and in compliance with the requirements contained in DOE Order 5400.5, Radiation Protection of the Environment and Public, and applicable Nuclear Regulatory Commission or State licensing requirements.

The guidance provided below will assure consistency with the risk analyses conducted in support of the policy development and will utilize existing site controls for implementation. The values provided in this guidance are to be used as a screening criteria or action level and do not imply risk or dose-based standards.

GUIDANCE

The following are specific to: (1) the management of candidate RCCS, and (2) the low-level waste disposal containers fabricated from RCCS.

CANDIDATE RADIOACTIVELY CONTAMINATED CARBON STEEL

Candidate materials to be recycled into low-level waste containers will have contamination levels less than 100 times the DOE Order 5400.5, Radiation Protection of the Environment and Public, Table 1, Surface Activity Guidelines, and be managed consistent with site practices for other materials with similar contamination levels.

CONTAINERS FABRICATED FROM RADIOACTIVELY CONTAMINATED CARBON STEEL

The following guidance applies unless the containers meet approved site authorized limits (pursuant to DOE Order 5400.5) for mass-based residual radioactivity. The containers are considered radioactive material and must be controlled by the Department site administrative controls. The analyses conducted in support of the Recycling Policy indicate that the containers will not result in contamination spread or require dosimetry for handling or storage.

Disposal containers fabricated from RCCS are limited to one-time use (from fabricator to generating site to disposal site); they are not to be reused. The containers are to be used as disposal containers for low-level waste and will be disposed of in a timely manner along with the waste.

The unfilled containers will conform to the removable contamination levels described in DOE Order 5400.5, Table 1 (see attached Table 1).

Because DOE's low-level waste disposal sites must know the concentration of all radionuclides disposed (to support site-specific performance assessments), the containers will be permanently and conspicuously labeled and marked as being fabricated from radioactive material with the specific activity values noted. All labeling and marking will be consistent with the requirements of DOE Order 5400.5, Table 1.

BACKGROUND

Integral to the development of the Office of Environmental Management's RCCS Recycling Policy was the assessment of radiological risks from the activities anticipated to be necessary for policy implementation. Constraining assumptions were developed for the radiological characteristics of the low-level waste disposal containers fabricated from RCCS and radiation doses received during processing. In general, the values identified in the risk analyses conducted in support of the RCCS Recycling Policy were "order of magnitude" screening evaluations and demonstrated the technical viability and acceptability of the policy. Adherence to this guidance establishes a starting point for site activities. These values may be superseded by site-specific analyses.

The guidance strikes a balance between conservatism and realism. The guidance concerning maximum contamination levels is below that in the Recycle Policy Risk Analysis (see reference). The vast majority of radioactively contaminated carbon steel is contaminated at levels well below the guidance. This is primarily due to ongoing contamination control programs, application of "as low as reasonably achievable" at the sites, and field practices. A prime example is the metal associated with building superstructures, which typically has very low contamination (e.g., building K-31 at Oak Ridge where contamination levels average below 10,000 dpm/100 cm²).

EXPLANATION REGARDING 100 TIMES TABLE 1 VALUES

Implementability of this guidance is enhanced by the use of existing and practiced guidance. The guidance needs to be in terms which are already being employed and not burden personnel with the creation of new criteria. Accordingly this guidance is provided in terms with which the operating personnel at sites are familiar.

Materials to be recycled are limited to 100 times the values in DOE Order 5400.5, Radiation Protection of the Environment and Public, Table 1, Surface Activity Guidelines, which corresponds to existing trigger levels for controlling contamination by establishment of "high contamination areas."

REFERENCE

"Assessment of Risks and Costs Associated with Transportation of DOE Radioactively Contaminated Carbon Steel" - S. Y. Chen, L. A. Nieves, J. Arnish, S. Folga, Argonne National Laboratory, November 1995

ATTACHMENT 2

BACKGROUND INFORMATION ON THE OFFICE OF ENVIRONMENTAL MANAGEMENT RECYCLING
POLICY FOR RADIOACTIVELY CONTAMINATED CARBON STEELBACKGROUND/DISCUSSION:

The Office of Environmental Management (EM) annually disposes of more than 40,000 cubic meters of low-level radioactive waste and radioactively contaminated scrap metal. The Environmental Restoration Program will be generating hundreds of thousands of tons of radioactively contaminated scrap metal as surplus facilities are decommissioned. Disposal of this material as low-level waste will consume a large volume of disposal capacity.

The EM Program has a responsibility to protect the environment, including minimizing the volume of waste requiring disposal. Waste minimization is also in accordance with Executive Order 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements" (August 3, 1993). A key way to minimize waste disposal is to recycle materials that have outlived their original use but still may be recycled to have economic value. Much of the radioactively contaminated scrap metal that has been or will be generated within the EM Program is suitable for reuse, but because of the type or distribution of contamination, it cannot economically be decontaminated sufficiently for unrestricted release.

To date, this radioactively contaminated scrap metal has primarily been managed in one of two ways:

- packaged as low-level waste and disposed of via shallow land burial
- stored pending funding availability for packaging and disposal

The first approach incurs the costs associated with managing this material within the current program budget. The second approach defers these costs, and potentially increases them, as this storage is generally outdoors, and there is potential for migration of contaminants from the stored radioactively contaminated scrap metal (most of which is carbon steel). Additionally, the second approach causes deterioration of the metal, potentially making it unsuitable for recycling. Although a number of sites have recycled materials or are actively pursuing recycling, to date the majority of radioactively contaminated carbon steel is still being managed in one of the above two ways.

The Office of Environmental Restoration has explored developing a recycling policy to address the large volumes of radioactively contaminated scrap metal. Communications were initiated with key stakeholders (Department of Energy Operations Offices, management and operation contractors, public interest groups, regulators, labor and industry) in mid 1994. Two workshops (each attended by more than 25 people) were held during 1994 and 1995 to identify and address stakeholder concerns associated with establishing a recycling policy. At the request of stakeholders participating in these workshops, the scope of a recycling policy was specifically limited to radioactively contaminated carbon steel (RCCS).

Three options were explored with stakeholders:

- Continuing RCCS disposal operations as currently practiced;
- Processing RCCS into ingots (a volume reduced form) for disposal, and
- Processing RCCS into disposal containers for one-time use within the Environmental Management Program.

Stakeholders indicated they were supportive of the RCCS recycling concept subject to certain conditions. Stakeholders also asked DOE for more and better information upon which to base policy development. In response to this request, and to ensure the stakeholder conditions were met, the following analyses were performed:

"Assessment of Risks and Costs Associated with Transportation of DOE Radioactively Contaminated Carbon Steel" - S. Y. Chen, L. A. Nieves, J. Arnish, S. Folga, Argonne National Laboratory, November 1995

"Recycling of DOE Radioactively Contaminated Carbon Steel: Limiting Concentrations and Risk Evaluation" - M. A. Simek, C. W. Smith, J. L. Legg, D. A. Wollert, Center for Risk Management, Oak Ridge National Laboratory, November 1995.

"Cost Model for DOE Radioactively Contaminated Carbon Steel Recycling" - S. W. Warren, U. S. DOE, R. S. Moore, R. E. Gant, CACI International (Automated Sciences Group), K. Robertson, The Robertson Group, November 1995.

"White Paper - Issues Discussion and Recommended Resolution of Commingling, Production Cost, Mixed Waste, Throughput Assumptions and Background for Recycle 2000 Option 3 (rev 2)" - D. Burns, Trinity Environmental Systems, Inc., November 1995.

Based on the results of these analyses, stakeholders indicated a strong preference for recycling RCCS. Specifically, they encouraged DOE to establish a RCCS recycling policy with a two-three year demonstration, then re-evaluate the success and cost of the policy. They further recommended that DOE pursue the processing of RCCS into disposal containers. These disposal containers should be used by waste generating sites as one-time-use packages for low-level waste disposal at DOE facilities. Stakeholders also wanted to ensure that any processing of the RCCS would be in a facility licensed by the Nuclear Regulatory Commission or Agreement State (if done by industry) or in compliance with DOE orders. Further, they wanted to ensure that all secondary wastes from the processing would remain the responsibility of the Department.

Therefore, for waste generating sites, containers fabricated from RCCS should be utilized to the extent practicable. Disposal sites should accept waste packaged in disposal containers made from RCCS provided the waste and packages meet all site-specific waste acceptance criteria. Release or processing of any contaminated or previously contaminated metals must be in compliance with applicable requirements, which may include Nuclear Regulatory Commission or State licensing requirements.

Stakeholders recognized that initiating recycling operations within the EM Program may increase near-term costs in some cases. However, they strongly believed the benefit to the environment of decreasing the volume of material being disposed of, as well as avoiding the use of clean metal for disposal packages, justifies this near-term cost increase. They recognized that implementing this policy may require sites to reallocate existing funding. Discussions with the metal recycling industry suggest that there is limited existing capacity for recycling DOE's RCCS into disposal containers. Other analyses indicate that although the industrial infrastructure is not fully in place, recycling into disposal containers can be done cost effectively. However, it may be that in the early stages of implementing this policy, the cost of recycling will exceed the cost of disposal. Therefore, site-specific cost analyses performed to assess the cost-effectiveness of recycling should include the cost savings associated with avoiding the disposal of the RCCS as waste, since disposal is also a cost to the EM Program. Further, you should work with your site-specific stakeholders to assess their views on recycling and to determine their level of support for recycling of RCCS into disposal containers in the event it initially costs more than disposal.

Stakeholders agreed that, based on these analyses, it is clear that recycling (including transportation of RCCS to an industrial location for decontamination, melting, and fabrication into disposal containers, as well as transportation and use of these containers at a Department of Energy generating site) can be done in a manner that protects DOE's workers, the public, and the environment. These analyses identified specific contamination levels as suitable for recycling; these levels are provided in the Radiological Guidance for Implementing the Office of Environmental Management's Carbon Steel Recycling Policy and shall be followed in the absence of site-specific guidelines.

Some sites have compliance agreements or have made commitments to stakeholders to dispose of radioactively contaminated carbon steel through onsite bulk disposal. Disposal is the appropriate option for these materials, as well as metals that are too deteriorated or too highly contaminated to recycle.

Regarding the application of the National Environmental Policy Act (NEPA) in connection with the RCCS recycling policy, if the decommissioning decision document is prepared under CERCLA and covers the disposition of the metal, then no further NEPA analysis should be required. If the decommissioning decision document is prepared under CERCLA but does not cover the disposition of the metal, or if the decommissioning decision has been made under some authority other than CERCLA, sites should consult your NEPA Compliance Officer to determine the appropriate NEPA review strategy.

Innovative approaches may exist to enhance implementation of this policy, including: (1) working with other Operations Offices to place orders for disposal containers made from radioactively contaminated carbon steel, thereby enabling vendors to realize economies of scale; (2) surveying and segregating metals either in storage or being generated at your site to enable immediate accumulation of an inventory suitable for recycling (consistent with applicable regulatory requirements and commitments); and (3) identifying vendors willing to provide recycling services, provided that ownership of the metal (and any resulting wastes) is retained by DOE. Sites are encouraged to pursue these and other approaches to implement the RCCS Recycling Policy cost-effectively.

ATTACHMENT 3

Criteria to consider in evaluating Lead Site nominations:

(Proposal will be no more than five pages)

Federal and contractor key personnel

- People with specific experience in:
 - setting up a new program
 - working with other sites
 - recycling contaminated materials (or non-radioactive materials from a DOE site)
- accessibility of a federal "Stakeholder Involvement" person (to work with complex-wide contacts in involving stakeholders in the site-specific decision-making)

Cost:

- cost of the proposal as presented
- site contribution to the total cost

Past Performance:

- site experience with recycling radioactive and non-radioactive materials
- procuring recycling materials/innovative procurements
- previous successful lead site experience/previous inter-site coordination activities

Technical Approach and Management Plan:

- How will you collect data on inventory of materials and need for containers?
- What efforts will be undertaken to ensure the use of standardized containers (e.g. M-100 boxes) for low level waste disposal?
- how will you broker small site RCCs and achieve complex-wide economies of scale?
- describe your data management capabilities (to work with sites to identify what is available on what schedule and it's condition)
- describe your inventory workoff logistics (how available metal will be coordinated with boxes to be available and with sites needing boxes-supply)

and demand logistics)

- how will you identify and implement use of RCCs-fabricated low-level waste disposal containers from and for a specific project